Amyotrophic Lateral Sclerosis (ALS) is a common neuro muscular disease without effective treatment characterized by the selective degeneration of motor neurons resulting in paralytic death. In a familial subset of ALS, mutant Cu/Zn superoxide dismutase (SOD1) enzymes initiate and sustain this disorder disease-dependent. SOD1 is a highly conserved 153-residue β-barrel homodimer that serves as the predominant intracellular scavenger of neuro toxic superoxide anion radical (O₂⁻). Determining the gain-of-function mechanism of SOD1 toxicity for therapeutic intervention in ALS has been the subject of continuing research for over fifteen years.

Pathogenic SOD1 species aberrantly oligomerize, and a portion of these multimers form cytolytic mass aggregates. Aggregate depositions are primarily detected biochemically and histologically, the data of which has led to several implicit observations:

- Every toxic SOD1 mutant assayed thus far forms distinct but relatively variable detergent-insoluble aggregates whereas wildtype (WT) and other innocuous SOD1s remain primarily soluble (1,2).
- Relative to a mutant standard, mutant aggregation potential in HEK cell culture is correlate with a shorter disease duration in patient cohorts (1).
- Spinal cord extracts of symptomatic transgenic mice show rapid accumulation of aggregate SOD1 over the course of disease (2), and deposition occurs near-selectively in the ventral horn (3).

Mutant SOD1 dossiers: D101N and D101G
Historically, mutant comparisons have been helpful for delineating toxic function. For examples: double-cysteine-like GTG/CUG (D101G) and WT-lobe acrylamide gels. Gels were
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Cell culture and transfections. SOD1 cDNAs added to the mammalian expression vector pEF-BOS were prepared by double-cysteine-like GTG/CUG (D101G) and WT-lobe acrylamide gels. Gels were
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